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INTELLIGENCE BRIEF

IDENTIFICATION OF SOVIET SOLID-PROPELLANT ROCKET FACILITIES CONFIRMED BY INDIAN PRODUCTION PLANS

DIRECTORATE OF INTELLIGENCE
Office of Research and Reports

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IDENTIFICATION OF SOVIET SOLID-PROPELLANT ROCKET FACILITIES CONFIRMED BY INDIAN PRODUCTION PLANS

Detailed documentary evidence on Soviet plans for construction of an installation for the production testing of air-to-air missiles near Nasik, India, permits the firm identification of five similar sites in the USSR as test facilities for solid-propellant rockets. This conclusion is based on three primary considerations, as follows: (1) the Nasik facility is of Soviet design; (2) it is designed specifically for the static firing of solid-propellant rockets; and (3) although smaller in size, the Nasik operational test area is identical in design concept to the Soviet facilities. In addition, this newly acquired evidence provides considerable insight into the operational procedures at Soviet test facilities.

1. Background

During the last several years the construction of unique test facilities at Krasnoyarsk, Perm', Biysk, Sterlitamak, and Kamensk-Shakhtinskiy has been monitored in KEYHOLE photography. Photography of a representative test facility at Krasnoyarsk is shown in Figure 1. These facilities are

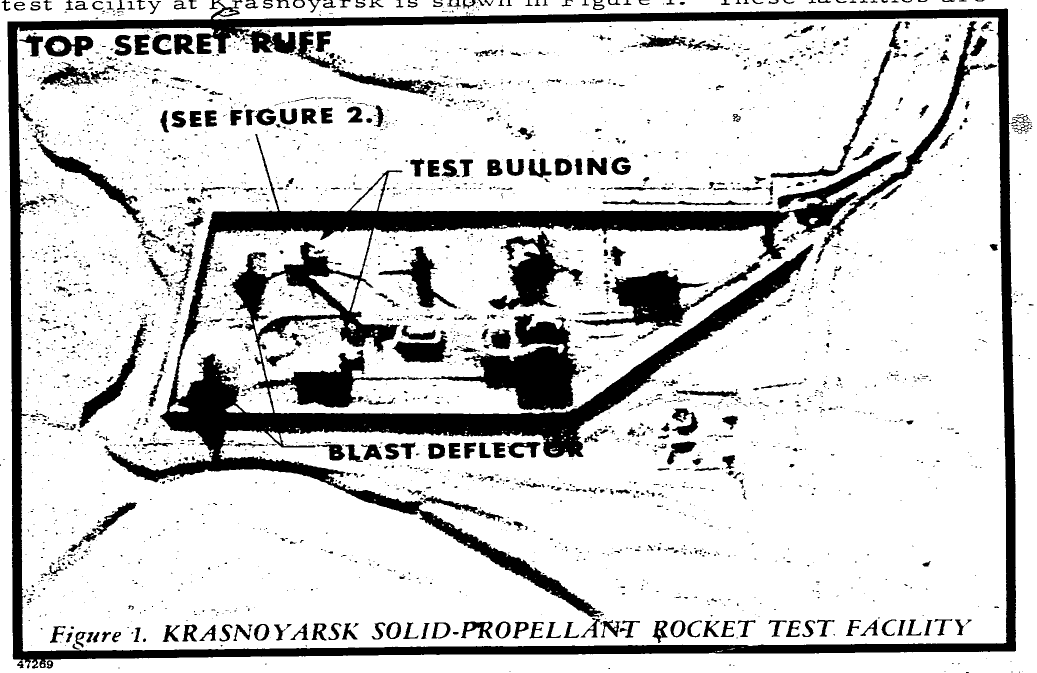

Figure 1. KRASNOYARSK SOLID-PROPELLANT ROCKET TEST FACILITY

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associated with chemical and explosives plants and are different from any others identified in the USSR. Some of these plants traditionally have been engaged in the production of conventional rockets. Since first observed, these test facilities have been the center of considerable discussion within the intelligence community concerning both their purpose and capabilities. The new evidence relating to the Nasik facility applies to both these questions.

2. Discussion

Early this year, intelligence sources acquired a project report prepared in January 1964 by the Ministry of Defense of the government of India for construction of a missile plant near Nasik, India. The project report establishes the detailed plans for implementing missile production under the terms of the Soviet-Indian agreement of August 1962 and states that the plant will produce the mechanical sections of the K-13, a Soviet solid-propellant air-to-air missile, designated by US intelligence as the AA-2.

The project report specifies the construction, as part of the missile plant, of a unique, isolated facility for static testing, under environmental conditions, a part of the annual quota of missiles produced and suggests that the test facility be located near a "chemical factory." As noted earlier, the five propulsion test facilities in the USSR are all adjacent to chemical and explosives plants.

The operational area of the Indian production test facility is identical to the five facilities in the USSR in design concept, although it is smaller in size. A comparison of the test areas at the Nasik and Krasnoyarsk facilities (as shown in Figure 2) discloses the following features that are common to both areas:

(1) An elaborately built-up blast deflector (Item A), described in the project report as being for the purpose of intercepting fragments of the solid grain in the exhaust plume as well as those resulting from a possible explosion.

(2) A rocket motor test building (Item B), which is to be constructed at Nasik of heavy reinforced concrete to allow for static testing within the building.

(3) A concrete strip running between the test building and its associated blast deflector and up the face of the deflector (Item C). As described for the Nasik facility, this

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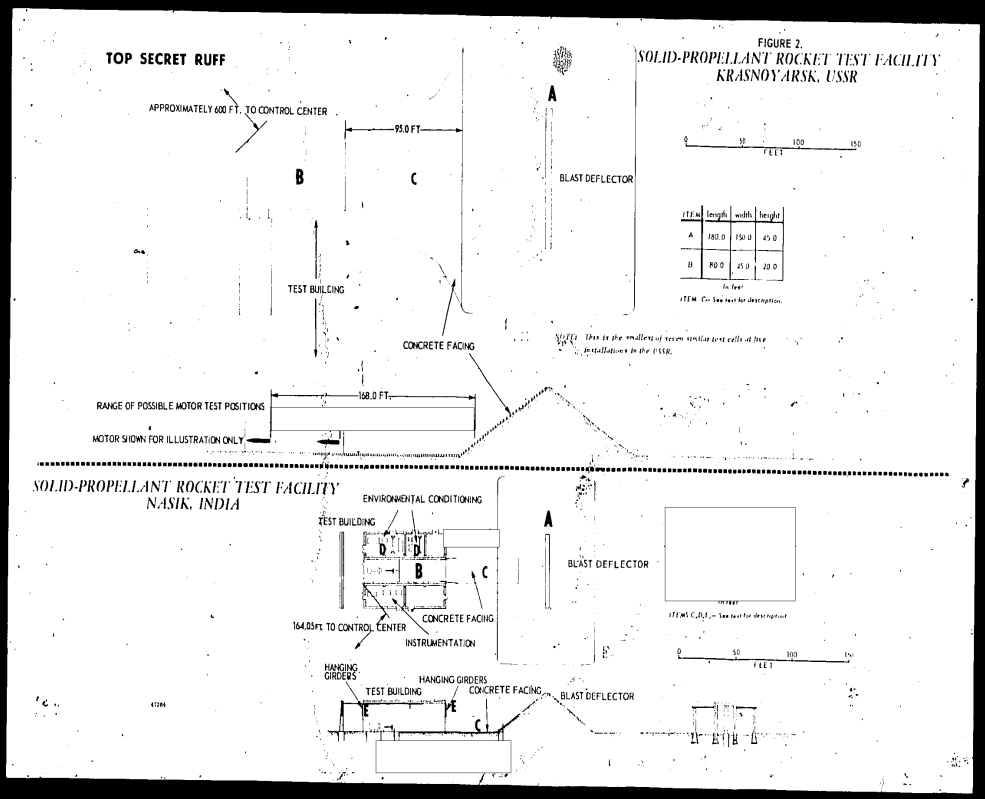
FIGURE 2.



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strip is composed of heat-resistant concrete and covers the area at which the rocket exhaust impinges on the blast deflector.

Other features inside the test building are described in the project report for the Nasik facility, but these are not identifiable in KEYHOLE photography of the Soviet installations. As noted in Figure 2, the plans locate facilities within the test building for environmentally conditioning rocket motors prior to testing (Item D). The plans also provide for the hanging of girders in the fashion of "venetian blinds" at both ends of the test building in order to confine the trajectory of fragments from a rocket under test or from an explosion (Item E).

3. Some Implications of the Evidence

Together, these features help considerably to explain the function of the Soviet test facilities and should in turn lead to a better evaluation of Soviet solid rocket programs. As described in the project report, the test building most nearly resembles a "test tunnel." The thrust of the rocket motor and its position within the building appear to be closely related to the width of the test tunnel, the height of the hanging girders, and the size and location of the blast deflector. An understanding of these interrelationships at the Nasik facility should permit a better assessment of the size and thrust of the solid motors undergoing test at the five Soviet facilities.

Because all the test facilities of this type in the USSR are larger than the one at Nasik, it is clear that they are intended for testing larger motors. A technical analysis by the Air Force Foreign Technology Division (FTD) of the thrust capability of the Soviet test facilities, based primarily on the distance between the test building and the blast deflector, indicates that the maximum thrust at the largest facility could be about 300,000 pounds for a single motor. If the FTD analysis were applied to the Nasik facility, it would yield a thrust capability of approximately 17,000 pounds. Because the K-13 motor to be tested at the Indian facility has a thrust rating on the order of 4,000 pounds, it appears that the Soviet facilities operate considerably below their apparent theoretical capabilities. Moreover, placement of the motor within the test building limits the amount of propellant that can be handled, and this too tends to limit the size and thrust of the motor. Further analysis may delineate the maximum specifications of solid rockets undergoing tests at Soviet facilities, but at this time the procedures indicated by the project report imply that they are designed for handling motors of moderate size.

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